

A3
Cont'd

where the non-ionic amine oxide surfactant gelling agent is
present in the aqueous base fluid in a proportion from about
0.5 to about 25 vol. %
in the absence of another gelling agent.—

The claims remaining in the application are 1, 4-10, and 13-17.

REMARKS

The Applicants would like to thank the Examiner for the very quick and courteous Office Action.

Applicants' Invention

The Applicants' invention is adequately outlined in independent claims 1, 10, and 17 as amended above.

35 U.S.C. §112, Second Paragraph, Rejection

The Examiner has rejected claims 8 and 9 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8, line 12, teaches "easily removed solid" without teaching the structure or feature that makes such easily removed. The scope of the claim is thus not clear.

Claim 9 teaches "reactive agent" without teaching what such agent is reactive toward, or the structure of such agent. The scope of the claim is thus not clear.

The Applicants appreciate the Examiner pointing out the concern with respect to the phrase "easily removed solid". The Examiner's attention is respectfully directed to the amendment to claim 8 herein where the phrase

"easily removed" has been deleted, thus rendering this point of rejection moot.

The Applicants appreciate the Examiner pointing out the concern with respect to the phrase "reactive agent". The Examiner's attention is respectfully directed to the amendment to claim 9 herein where the word "reactive" has been deleted from modifying the word "agent", and the agent has been further defined as --reactive with the gel--. It is respectfully submitted that this latter wording is apparent from the clear meaning of the specification as filed, and thus does not constitute improper insertion of new matter. For instance, the Examiner's attention is respectfully directed to the paragraph on page 5, lines 12-18, where the topic is clearly breaking the gel of the aqueous viscoelastic treating fluids of the invention by a variety of mechanisms. One of ordinary skill in the art would understand that the reactive agent breaks this gel by reacting with it. If another interpretation is possible, the Applicants would respectfully invite the Examiner to discuss it.

It is further respectfully submitted that the agent may be any one of a number of possible agents, and lacking a reference teaching or suggesting such agent, the Applicants are entitled to broad language in describing such agents. It is respectfully submitted that this point of rejection is overcome by this amendment.

35 U.S.C. §102 Rejection Based on Blezard, et al.

The Examiner has rejected claims 1-5, 7-15 and 17 under 35 U.S.C. 102(b), as being allegedly anticipated by U.S. Pat. No. 5,807,810 to Blezard, et al.

Blezard, et al. are seen to teach viscoelastic fluids which comprise a nonionic amine oxide which is used in areas such as for drilling fluids and spacer fluids. It is seen that dilution may be used to break the viscoelastic fluid. The Examiner concludes by contending that the invention is anticipated by Blezard, et al.

The Applicants must respectfully traverse.

The Examiner's attention is respectfully directed to the amendments made herein to claims 1, 10, and 17 where the non-ionic amine oxide surfactant is now recited as the only gelling agent employed. These amendments do not constitute improper insertion of new matter, as such recitations were present in dependent claims 2 and 11 as filed, and elsewhere. (These dependent claims have now been cancelled as redundant.)

Blezard, et al. is directed to aqueous structured fluids made using water, surfactants and a substantially water insoluble functional material in the absence of an electrolyte. The surfactant may be amine oxides. However, in Examples 4, 5 and 7 of Blezard, et al., the only Examples therein which use amine oxides, at least another surfactant, LABS (sodium C₁₀₋₁₄ linear alkyl benzene sulfonate), is also used. Diethanolamine C₁₀₋₁₄ linear alkyl benzene sulfonate (DEABS) is additionally used in Examples 4 and 5; thus a third material is present which serves as a gelling agent. Further Blezard, et al. are consistent in teaching and using more than one surfactant in their patent; please see, for instance, column 8, line 44 to column 9, line 13. Blezard, et al. require that two or more surfactants be used to create their micellar solution. (The Applicants stipulate that Blezard, et al. occasionally refer to surfactant in the singular. It is somewhat difficult to know exactly what Blezard, et al. intends in their invention, for example, sometimes the composition is free from electrolyte (see Abstract), and other times it seems required (see column 11, lines 17-18).)

Please also note the consistent use in the claims of a structured surfactant *system*, consistent with the use of more than one surfactant as taught in the Summary of the Invention. Certainly, Blezard, et al. do not teach or suggest using amine oxides as the only gelling agent as now required by the instant, amended claims. In the Applicants' commercial application of the aqueous viscoelastic treating fluids of the invention, there is no dependence on other surfactants to develop viscosity or solids transport capability. It is

respectfully submitted that the claimed invention is now patentably distinct over Blezard, et al.

For a comparison of single gelling agents, the Examiner's attention is respectfully directed to the discussion of Examples 2-8 on pages 6, line 7 to page 7, line 14, of the specification as filed, and to FIG. 2 where the results are plotted. There it is demonstrated that using amine oxide as the only gelling agent gives stable fluids over the tested temperature range as compared with conventional gelling agents which, when used alone, uniformly lost viscosity with increasing temperature (or never achieved much viscosity to begin with).

It is further respectfully noted that dilution is no longer claimed as a mechanism for breaking the gels of the instant invention. The Examiner's attention is respectfully directed to the amendments to claim 9 where the term "dilution" has been deleted.

35 U.S.C. §102 Rejection Based on Thompson

The Examiner has rejected claims 1-5, 7, 8, 10-15 and 17 under 35 U.S.C. 102(b), as being allegedly anticipated by U.S. Pat. No. 4,113,631 to Thompson.

Thompson is seen to teach a well treating composition which comprises a nonionic amine oxide such as dimethyl tallowamine oxide, and may comprise other agents such as acids and clay. The Examiner asserts that such compositions would be viscoelastic in nature. The Examiner concludes by contending that the invention is anticipated by Thompson.

The Applicants must respectfully traverse.

It is respectfully submitted that Thompson is directed to foaming and silt suspending agents containing at least one alkyltrimethylammonium chloride and an amine oxide. These agents are taught to be useful in aqueous based fluids to treat subterranean formations as clay stabilization agents. Again, Thompson requires at least one other component in the agent blend

throughout their patent, namely, at least one alkyltrimethylammonium chloride. As the instant claims now recited that the amine oxide is the only gelling agent employed, the claims are now distinct over Thompson.

Reconsideration is respectfully requested.

35 U.S.C. §103 Rejection Over Blezard, et al.

The Examiner has rejected claims 1, 6, 10, and 16 under 35 U.S.C. 103(a), as being allegedly unpatentable over Blezard, et al. for reasons of obviousness.

The Examiner finds that Blezard, et al. teaches viscoelastic fluids which comprise a nonionic amine oxide which are used in areas such as for drilling fluids and spacer fluids. Dilution may be used to break the viscoelastic fluid. The Examiner admits that Blezard, et al. differs from the present invention in not specifically teaching the use of tallow amido propyl amine oxide as an amine oxide useful in the invention. The Examiner further finds that Blezard, et al. however teaches the use of C 12-16 alkyl dimethyl amine oxide in the drilling and treating fluids of column 15. As homologues and analogues with such similar structures would be expected to have similar properties and utility, the Examiner contends it would be obvious to one of ordinary skill in the art to utilize various homologues and analogues of the amine oxides disclosed by Blezard, et al., including the tallow amido propyl amine oxide of the present invention, such homologues and analogues would be expected to be useful in the viscoelastic well fluids of Blezard, et al.

The Applicants must respectfully traverse.

It is respectfully submitted that the recitation in all claims that the amine oxide surfactant gelling agent is the only gelling agent present also patentably distinguishes the amended claims over Blezard, et al. in this rejection. That is, as established above, Blezard, et al. consistently show that another surfactant with gelling agent properties must be used with their amine oxides, whereas the Applicants have shown this not to be the case. As

mentioned above with respect to the first art rejection over Blezard, et al., the reference clearly teaches that a linear alkyl benzene sulfonate is required when amine oxides are used; as seen by the Examples in column 15 noted by the Examiner. There is no hint or suggestion in Blezard, et al. that an additional gelling agent should or could be omitted when amine oxides are employed.

It is further respectfully submitted that it cannot be assumed that one of ordinary skill in the art would make the assumption that the Examiner makes. In the world of micellar chemistry, the size of the R' groups determines the shape and the stability of the micelle formed. One of the effects discovered in going from a methyl group to a propyl group appears to be an increase in the length of the micelle. Blezard, et al. use the methyl groups and produces a spherical-shaped micelle. This shape is probably a minimum requirement for suspending very fine particles such as barite (approximately US 400 mesh). When the R' group is a propyl group, a higher charge density is built up due to the "insulating" effect of the group. The resulting electric field is stronger and has the effect of stabilizing longer micelles to the extent that they become rods or branched, worm-like shapes. These shapes are now capable of forming "net-like" structures in solution. The shape is very important to transport sand or proppant (US 20/40 mesh). This result could not have been predicted from Blezard, et al.'s teachings. Further, while Blezard, et al.'s fluid will probably transport sand, the Applicants have discovered the rod-shaped micelles give a preferred embodiment because of their excellent ability to carry sand at relatively very low viscosity.

Reconsideration is respectfully requested.

35 U.S.C. §103 Rejection Over Thompson

The Examiner has rejected claims 1, 6, 10, and 16 under 35 U.S.C. 103(a), as being allegedly unpatentable over Thompson for reasons of obviousness.

Thompson is seen to teach a well treating composition which comprises a nonionic amine oxide such as dimethyl tallowamine oxide, and may comprise other agents such as acids and clay. The Examiner asserts that such compositions would be viscoelastic in nature. The Examiner admits that Thompson differs from the present invention in not specifically teaching the use of tallow amido propyl amine oxide as an amine oxide useful in the invention. The Examiner further finds that Thompson however teaches the use of tallow dimethyl amine oxide in the well treating fluids (noting the Abstract). As homologues and analogues with such similar structures would be expected to have similar properties and utility, the Examiner contends it would be obvious to one of ordinary skill in the art to utilize various homologues and analogues of the amine oxides disclosed by Blezard, et al., including the tallow amido propyl amine oxide of the present invention, such homologues and analogues would be expected to be useful in the viscoelastic well fluids of Blezard, et al.

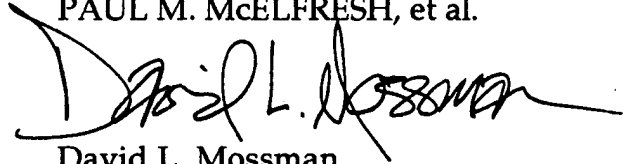
The Applicants must respectfully traverse. Again, it is respectfully submitted that the amended claims are not obvious from Thompson because the reference requires in all cases the presence of at least one alkyltrimethylammonium chloride and the claims now explicitly recite the absence of additional gelling agents. It is further respectfully submitted that Thompson does not suggest or hint at the absence of at least one alkyltrimethylammonium chloride in their compositions. That is, there is no teaching in Thompson that the alkyltrimethylammonium chloride may be omitted and any useful fluid result. Thus, the claims as amended are patentably distinct therefrom.

Reconsideration is respectfully requested.

It is respectfully submitted that the arguments and amendments presented above overcome the instant rejections. Reconsideration of the claims is respectfully requested. The Examiner is respectfully reminded of his

duty to indicate allowable subject matter. The Examiner is invited to call the Applicants' attorney at the number below for any reason, especially any reason which may help advance the prosecution.

Respectfully submitted,
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